

SEQUENCE LISTING

<110> Commonwealth Scientific and Industrial Research Organisation
EAST, Peter David

<120> Toxin Genes from the Bacteria *Xenorhabdus nematophilus* and *Photorhabdus luminescens*

<130> 050179-0076

<140> 09/463,048

<141> 2000-01-18

<150> PCT/AU98/00562

<151> 1998-07-17

<150> PO 8088

<151> 1997-07-17

<160> 20

<170> PatentIn version 3.1

<210> 1

<211> 1107

<212> DNA

<213> *Xenorhabdus nematophilus*

<400> 1

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acgcctgatg ataaaggtga atatcaaccc gttgaaaagc aaatagcggg agatataata	120
cgtgtactag aattcaagca aacaaatgaa agtcatacag gattgtatgg aattgcataat	180
cgagctaaga aagtaataat agcatatgct ttagcggtaa gtggtattca taatgtctct	240
caacttccag aagactatta taaaaataag gataacacag gtagaattta tcaagaataac	300
atgtctaatac ttttatctgc actattgggt gagaatggtg atcaaatttc taaagatatg	360
gcaaatgatt ttacccagaa cgaactggag tttggaggtc aacgtcttaa aaatacctgg	420
gatattcctg atcttgagaa taaactatttgaagattt cagatgaaga taaatttattt	480
gcactatatt tctttgcttc acaagaactt ccaatggagg caaatcaaca atcaaatgca	540
gcaaattttt ttaaagtaat tgattttta cttatctt ctcgtgttaac atcactggaa	600
aaaaggattt ttcaaaaaaa ttttacaat ggtctagaaa ctaaatcatt agagaatttt	660
attgagagaa aaaaactttc taaaccttc ttgcaccac cgcagaagtt acctgtatggc	720
agaacaggct acttggccgg tccaaacaaaa ggcgcctaaat tgccaaacaac gtcttctaca	780
gcaacaacat ctacacgac ttcatcta tggagagttt gtttgcaaaa acttagagat	840

aaccatcca	gaaatacatt	tatgaaaatg	gatgatgctg	caaaacgaaa	atatagttca	900
tttataaaag	aggtacaaaa	ggtaatgat	ccacgtgcag	cagcagcaag	tattggtaca	960
aaaagcggca	gtacttcga	aaaactgcaa	ggtagagatt	tatatagtat	aagactaagc	1020
caagaacaca	ggtaacatt	ctccataaat	aatactgacc	aaataatgga	gatccaaagt	1080
gttggactc	attaccaaaa	tatataa				1107

<210> 2
<211> 1008
<212> DNA
<213> *Photorhabdus luminescens*

<400> 2						
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gcaggagata	tagtacgtat	actaaacttt	aagcaaacag	atgagggtca	tacagcatca	120
tatggatttgc	aatatcgagc	taagaaaata	atattagctt	acgctttggc	tgtaagtgg	180
attcataatg	tatctaaact	tcctgatgac	tattataaga	ataaagagac	tgctgagaga	240
atttatcaag	aatatatgtc	taatcttca	tctgcactat	taggtaaaaa	tggatgtcaa	300
atttctaaag	atatggcaaa	tggttttat	aagaatgaac	tggatttga	aggtaatat	360
cctcaaaaca	tttggaatgt	tcctgagctt	gaaaataaac	cattgagtgc	ttattcagat	420
gacgataaat	tattagcaact	atatttttc	tctgtacagg	aaattccact	ggagggaaat	480
caacaatcaa	atgccgcaag	atttttaaa	ttaattgatt	tcttatttac	cttatctgct	540
gtaacttcac	tgggaaggag	gatttttca	aaaaactttt	acaatggatt	agaggctaaa	600
tcatttagaga	attatattga	gagaaaaaaa	cttcataaac	cttcatttcg	accaccgcag	660
agattacctg	atggcagaat	agtttattt	gctggaccaa	cagaagcgcc	taaatggaga	720
gtgagttta	aagaacttaa	aaataacaaa	tcttaggaatg	gatttctaa	tatggaaagg	780
gctgcaaaac	aaaagtata	ttcatttata	aaagaggtac	aaaaggtaa	cgctccacag	840
acagcagcga	aaagtattgg	tacagccagt	ggcagtaacc	tggaaaaatt	gccgaataat	900
ttatatagtg	tgaggctaag	ccaaaaagac	aggtaacct	ttactaaaa	tgatactgac	960
aatacaatga	cggttcatag	tgttggact	cattataaaa	atataatga		1008

<210> 3
<211> 368
<212> PRT
<213> *Xenorhabdus nematophilus*

<400> 3

Met Val Ile Lys Pro Val Thr Thr Pro Ser Val Ile Gln Leu Thr Pro
1 5 10 15

Asp Asp Arg Val Thr Pro Asp Asp Lys Gly Glu Tyr Gln Pro Val Glu
20 25 30

Lys Gln Ile Ala Gly Asp Ile Ile Arg Val Leu Glu Phe Lys Gln Thr
35 40 45

Asn Glu Ser His Thr Gly Leu Tyr Gly Ile Ala Tyr Arg Ala Lys Lys
50 55 60

Val Ile Ile Ala Tyr Ala Leu Ala Val Ser Gly Ile His Asn Val Ser
65 70 75 80

Gln Leu Pro Glu Asp Tyr Tyr Lys Asn Lys Asp Asn Thr Gly Arg Ile
85 90 95

Tyr Gln Glu Tyr Met Ser Asn Leu Leu Ser Ala Leu Leu Gly Glu Asn
100 105 110

Gly Asp Gln Ile Ser Lys Asp Met Ala Asn Asp Phe Thr Gln Asn Glu
115 120 125

Leu Glu Phe Gly Gly Gln Arg Leu Lys Asn Thr Trp Asp Ile Pro Asp
130 135 140

Leu Glu Asn Lys Leu Leu Glu Asp Tyr Ser Asp Glu Asp Lys Leu Leu
145 150 155 160

Ala Leu Tyr Phe Phe Ala Ser Gln Glu Leu Pro Met Glu Ala Asn Gln
165 170 175

Gln Ser Asn Ala Ala Asn Phe Phe Lys Val Ile Asp Phe Leu Leu Ile
180 185 190

Leu Ser Ala Val Thr Ser Leu Gly Lys Arg Ile Phe Ser Lys Asn Phe
195 200 205

Tyr Asn Gly Leu Glu Thr Lys Ser Leu Glu Asn Tyr Ile Glu Arg Lys
210 215 220

Lys Leu Ser Lys Pro Phe Phe Arg Pro Pro Gln Lys Leu Pro Asp Gly
225 230 235 240

Arg Thr Gly Tyr Leu Ala Gly Pro Thr Lys Ala Pro Lys Leu Pro Thr
245 250 255

Thr Ser Ser Thr Ala Thr Ser Thr Ala Ala Ser Ser Asn Trp Arg
260 265 270

Val Ser Leu Gln Lys Leu Arg Asp Asn Pro Ser Arg Asn Thr Phe Met
275 280 285

Lys Met Asp Asp Ala Ala Lys Arg Lys Tyr Ser Ser Phe Ile Lys Glu
290 295 300

Val Gln Lys Gly Asn Asp Pro Arg Ala Ala Ala Ser Ile Gly Thr
305 310 315 320

Lys Ser Gly Ser Asn Phe Glu Lys Leu Gln Gly Arg Asp Leu Tyr Ser
325 330 335

Ile Arg Leu Ser Gln Glu His Arg Val Thr Phe Ser Ile Asn Asn Thr
340 345 350

Asp Gln Ile Met Glu Ile Gln Ser Val Gly Thr His Tyr Gln Asn Ile
355 360 365

<210> 4
<211> 335
<212> PRT
<213> *Photorhabdus luminescens*

<400> 4

Met Val Ile Gln Leu Thr Pro Asp Asp Arg Ser Gly Tyr Pro Pro Val
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Glu Lys Gln Ile Ala Gly Asp Ile Val Arg Ile Leu Asn Phe Lys Gln
20 25 30

Thr Asp Glu Gly His Thr Ala Ser Tyr Gly Ile Glu Tyr Arg Ala Lys
35 40 45

Lys Ile Ile Leu Ala Tyr Ala Leu Ala Val Ser Gly Ile His Asn Val

50

55

60

Ser Lys Leu Pro Asp Asp Tyr Tyr Lys Asn Lys Glu Thr Ala Glu Arg
65 70 75 80

Ile Tyr Gln Glu Tyr Met Ser Asn Leu Ser Ser Ala Leu Leu Gly Glu
85 90 95

Asn Gly Asp Gln Ile Ser Lys Asp Met Ala Asn Gly Phe Tyr Lys Asn
100 105 110

Glu Leu Asp Phe Glu Gly Gln Tyr Pro Gln Asn Ile Trp Asn Val Pro
115 120 125

Glu Leu Glu Asn Lys Pro Leu Ser Ala Tyr Ser Asp Asp Asp Lys Leu
130 135 140

Leu Ala Leu Tyr Phe Phe Ser Val Gln Glu Ile Pro Leu Glu Glu Asn
145 150 155 160

Gln Gln Ser Asn Ala Ala Arg Phe Phe Lys Leu Ile Asp Phe Leu Phe
165 170 175

Thr Leu Ser Ala Val Thr Ser Leu Gly Arg Arg Ile Phe Ser Lys Asn
180 185 190

Phe Tyr Asn Gly Leu Glu Ala Lys Ser Leu Glu Asn Tyr Ile Glu Arg
195 200 205

Lys Lys Leu Ser Lys Pro Phe Phe Arg Pro Pro Gln Arg Leu Pro Asp
210 215 220

Gly Arg Ile Gly Tyr Leu Ala Gly Pro Thr Glu Ala Pro Lys Trp Arg
225 230 235 240

Val Ser Phe Lys Glu Leu Lys Asn Asn Lys Ser Arg Asn Gly Phe Ser
245 250 255

Asn Met Glu Gly Ala Ala Lys Gln Lys Tyr Ser Ser Phe Ile Lys Glu
260 265 270

Val Gln Lys Gly Asn Ala Pro Gln Thr Ala Ala Lys Ser Ile Gly Thr
275 280 285

Ala Ser Gly Ser Asn Leu Glu Lys Leu Pro Asn Asn Leu Tyr Ser Val
290 295 300

Arg Leu Ser Gln Lys Asp Arg Val Thr Phe Thr Gln Asn Asp Thr Asp
305 310 315 320

Asn Thr Met Thr Val His Ser Val Gly Thr His Tyr Lys Asn Ile
325 330 335

<210> 5
<211> 1205
<212> DNA
<213> *Xenorhabdus nematophilus*

<400> 5
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agcgggagat ataatacgtg tactagaatt caagcaaaca aatgaaagtc atacaggatt 180
gtatggaatt gcatatcgag ctaagaaagt aataatagca tatgcttag cgtaagtgg 240
tattcataat gtctctcaac ttccagaaga ctattataaa aataaggata acacaggtag 300
aatttatcaa gaatacatgt ctaatcttt atctgcacta ttgggtgaga atggtgatca 360
aatttctaaa gatatggcaa atgattttac ccagaacgaa ctggagttt gaggtaacg 420
tctaaaaat acctggata ttccctgatct tgagaataaa ctattggaag attattcaga 480
tgaagataaa ttattagcac tatatttctt tgcttcacaa gaacttccaa tggaggcaaa 540
tcaacaatca aatgcagcaa attttttaa agtaattgtat ttttactta tcttatctgc 600
tgtaacatca ctggaaaaaa ggatttttc aaaaaatttt tacaatggtc tagaaactaa 660
atcattagag aattatattg agagaaaaaa actttctaaa cctttcttc gaccaccgca 720
gaagttacct gatggcagaa caggctactt ggccggtcca acaaaagcgc ctaaattgcc 780
aacaacgtct tctacagcaa caacgtctac agcagctca tctaattgga gagttgttt 840
gcaaaaaactt agagataacc catccagaaa tacatttatg aaaaatggatg atgctgcaaa 900
acgaaaaatat agttcattta taaaagaggt acaaaagggt aatgatccac gtgcagcagc 960
agcaagtatt ggtacaaaaa gccccagtaa cttcgaaaaa ctgcaaggta gagatttata 1020
tagtataaga ctaagccaag aacacagggt aacattctcc ataaataata ctgaccataat 1080
aatggagatc caaagtgttg gaactcatta ccaaaatata taacctgatt tatagttagt 1140

ataagacgt a gataaaat ggaaggttgt aatttattt cacttcctca gaggtgaccg 1200
ctcag 1205

<210> 6
<211> 1388
<212> PRT
<213> Photorhabdus luminescens
<400> 6

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Cys Thr Thr Gly Cys Gly Thr Ala Ala Gly Thr Thr Ala Ala Thr Thr
20 25 30

Thr Thr Ala Cys Ala Thr Thr Gly Ala Ala Ala Thr Thr Ala Ala Cys
35 40 45

Gly Cys Thr Thr Ala Ala Ala Ala Gly Cys Cys Ala Gly Gly Gly
50 55 60

Ala Ala Ala Ala Cys Thr Cys Thr Ala Thr Ala Thr Thr Ala Ala
65 70 75 80

Ala Gly Thr Thr Gly Ala Ala Ala Thr Thr Thr Ala Thr Ala Thr Thr
85 90 95

Ala Gly Thr Ala Gly Cys Gly Ala Cys Ala Ala Ala Thr Thr Gly Cys
100 105 110

Gly Gly Ala Gly Thr Thr Thr Cys Thr Gly Cys Cys Ala Gly Ala
115 120 125

Ala Ala Thr Thr Cys Ala Thr Ala Gly Cys Thr Cys Ala Ala Ala
130 135 140

Thr Ala Ala Ala Cys Ala Thr Thr Ala Ala Cys Ala Thr Ala Ala Thr
145 150 155 160

Gly Gly Ala Gly Ala Ala Ala Thr Ala Thr Ala Ala Thr Gly Gly Thr
165 170 175

Thr Ala Thr Ala Cys Ala Ala Thr Thr Ala Ala Cys Ala Cys Cys Thr
180 185 190

Gly Ala Thr Gly Ala Thr Ala Gly Ala Ala Gly Thr Gly Gly Ala Thr
195 200 205

Ala Thr Cys Cys Ala Cys Cys Gly Thr Thr Gly Ala Ala Ala Ala
210 215 220

Gly Cys Ala Ala Ala Thr Ala Gly Cys Ala Gly Gly Ala Gly Ala Thr
225 230 235 240

Ala Thr Ala Gly Thr Ala Cys Gly Thr Ala Thr Ala Cys Thr Ala Ala
245 250 255

Ala Cys Thr Thr Ala Ala Gly Cys Ala Ala Ala Cys Ala Gly Ala
260 265 270

Thr Gly Ala Gly Gly Gly Thr Cys Ala Thr Ala Cys Ala Gly Cys Ala
275 280 285

Thr Cys Ala Thr Ala Thr Gly Gly Ala Ala Thr Thr Gly Ala Ala Thr
290 295 300

Ala Thr Cys Gly Ala Gly Cys Thr Ala Ala Gly Ala Ala Ala Ala Thr
305 310 315 320

Ala Ala Thr Ala Thr Thr Ala Gly Cys Thr Thr Ala Cys Gly Cys Thr
325 330 335

Thr Thr Gly Gly Cys Thr Gly Thr Ala Ala Gly Thr Gly Gly Thr Ala
340 345 350

Thr Thr Cys Ala Thr Ala Ala Thr Gly Thr Ala Thr Cys Thr Ala Ala
355 360 365

Ala Cys Thr Thr Cys Cys Thr Gly Ala Thr Gly Ala Cys Thr Ala Thr
370 375 380

Thr Ala Thr Ala Ala Gly Ala Ala Thr Ala Ala Ala Gly Ala Gly Ala
385 390 395 400

Cys Thr Gly Cys Thr Gly Ala Gly Ala Gly Ala Ala Thr Thr Thr Ala

405

410

415

Thr Cys Ala Ala Gly Ala Ala Thr Ala Thr Ala Thr Gly Thr Cys Thr
420 425 430

Ala Ala Thr Cys Thr Thr Cys Ala Thr Cys Thr Gly Cys Ala Cys
435 440 445

Thr Ala Thr Thr Ala Gly Gly Thr Gly Ala Ala Ala Ala Thr Gly Gly
450 455 460

Thr Gly Ala Thr Cys Ala Ala Ala Thr Thr Cys Thr Ala Ala Ala
465 470 480

Gly Ala Thr Ala Thr Gly Gly Cys Ala Ala Ala Thr Gly Gly Thr Thr
485 490 495

Thr Thr Thr Ala Thr Ala Ala Gly Ala Ala Thr Gly Ala Ala Cys Thr
500 505 510

Gly Gly Ala Thr Thr Thr Gly Ala Ala Gly Gly Thr Cys Ala Ala
515 520 525

Thr Ala Thr Cys Cys Thr Cys Ala Ala Ala Ala Cys Ala Thr Thr Thr
530 535 540

Gly Gly Ala Ala Thr Gly Thr Thr Cys Cys Thr Gly Ala Gly Cys Thr
545 550 555 560

Thr Gly Ala Ala Ala Ala Thr Ala Ala Ala Cys Cys Ala Thr Thr Gly
565 570 575

Ala Gly Thr Gly Cys Thr Thr Ala Thr Thr Cys Ala Gly Ala Thr Gly
580 585 590

Ala Cys Gly Ala Thr Ala Ala Ala Thr Thr Ala Thr Thr Ala Gly Cys
595 600 605

Ala Cys Thr Ala Thr Ala Thr Thr Thr Thr Thr Cys Thr Cys Thr
610 615 620

Gly Thr Ala Cys Ala Gly Gly Ala Ala Ala Thr Thr Cys Cys Ala Cys
625 630 635 640

Thr Gly Gly Ala Gly Gly Ala Ala Ala Ala Thr Cys Ala Ala Cys Ala
645 650 655

Ala Thr Cys Ala Ala Ala Thr Gly Cys Cys Gly Cys Ala Ala Gly Ala
660 665 670

Thr Thr Thr Thr Thr Ala Ala Ala Thr Thr Ala Ala Thr Thr Gly
675 680 685

Ala Thr Thr Thr Cys Thr Thr Ala Thr Thr Thr Ala Cys Cys Thr Thr
690 695 700

Ala Thr Cys Thr Gly Cys Thr Gly Thr Ala Ala Cys Thr Thr Cys Ala
705 710 715 720

Cys Thr Gly Gly Ala Ala Gly Gly Ala Gly Gly Ala Thr Thr Thr
725 730 735

Thr Thr Thr Cys Ala Ala Ala Ala Ala Cys Thr Thr Thr Thr Ala
740 745 750

Cys Ala Ala Thr Gly Gly Ala Thr Thr Ala Gly Ala Gly Gly Cys Thr
755 760 765

Ala Ala Ala Thr Cys Ala Thr Thr Ala Gly Ala Gly Ala Ala Thr Thr
770 775 780

Ala Thr Ala Thr Thr Gly Ala Gly Ala Ala Ala Ala Ala Ala
785 790 795 800

Ala Cys Thr Thr Thr Cys Thr Ala Ala Ala Cys Cys Thr Thr Thr Cys
805 810 815

Thr Thr Thr Cys Gly Ala Cys Cys Ala Cys Cys Gly Cys Ala Gly Ala
820 825 830

Gly Ala Thr Thr Ala Cys Cys Thr Gly Ala Thr Gly Gly Cys Ala Gly
835 840 845

Ala Ala Thr Ala Gly Gly Thr Thr Ala Thr Thr Thr Gly Gly Cys Thr
850 855 860

Gly Gly Ala Cys Cys Ala Ala Cys Ala Gly Ala Ala Gly Cys Gly Cys
865 870 875 880

Cys Thr Ala Ala Ala Thr Gly Gly Ala Gly Thr Gly Ala Gly
885 890 895

Thr Thr Thr Ala Ala Ala Gly Ala Ala Cys Thr Thr Ala Ala Ala
900 905 910

Ala Ala Thr Ala Ala Cys Ala Ala Ala Thr Cys Thr Ala Gly Gly Ala
915 920 925

Ala Thr Gly Gly Ala Thr Thr Thr Cys Thr Ala Ala Thr Ala Thr
930 935 940

Gly Gly Ala Ala Gly Gly Gly Cys Thr Gly Cys Ala Ala Ala Ala
945 950 955 960

Cys Ala Ala Ala Ala Gly Thr Ala Thr Ala Gly Thr Thr Cys Ala Thr
965 970 975

Thr Thr Ala Thr Ala Ala Ala Gly Ala Gly Gly Thr Ala Cys Ala
980 985 990

Ala Ala Ala Gly Gly Gly Thr Ala Ala Cys Gly Cys Thr Cys Cys Ala
995 1000 1005

Cys Ala Gly Ala Cys Ala Gly Cys Ala Gly Cys Gly Ala Ala Ala
1010 1015 1020

Ala Gly Thr Ala Thr Thr Gly Gly Thr Ala Cys Ala Gly Cys Cys
1025 1030 1035

Ala Gly Thr Gly Gly Cys Ala Gly Thr Ala Ala Cys Cys Thr Gly
1040 1045 1050

Gly Ala Ala Ala Ala Ala Thr Thr Gly Cys Cys Gly Ala Ala Thr
1055 1060 1065

Ala Ala Thr Thr Thr Ala Thr Ala Thr Ala Gly Thr Gly Thr Gly
1070 1075 1080

Ala ·Gly Gly Cys Thr Ala Ala Gly Cys Cys Ala Ala Ala Ala Ala Ala
1085 1090 1095

Gly Ala Cys Ala Gly Gly Thr Ala Ala Cys Cys Thr Thr Thr
1100 1105 1110

Ala Cys Thr Cys Ala Ala Ala Ala Thr Gly Ala Thr Ala Cys Thr
1115 1120 1125

Gly Ala Cys Ala Ala Thr Ala Cys Ala Ala Thr Gly Ala Cys Gly
1130 1135 1140

Gly Thr Thr Cys Ala Thr Ala Gly Thr Gly Thr Thr Gly Gly Ala
1145 1150 1155

Ala Cys Thr Cys Ala Thr Thr Ala Thr Ala Ala Ala Ala Ala Thr
1160 1165 1170

Ala Thr Ala Thr Gly Ala Thr Gly Ala Gly Thr Ala Ala Thr Cys
1175 1180 1185

Thr Cys Thr Gly Ala Cys Thr Thr Cys Gly Ala Thr Thr Gly Ala
1190 1195 1200

Cys Ala Gly Ala Gly Cys Ala Thr Thr Thr Thr Thr Ala Ala Gly
1205 1210 1215

Cys Thr Cys Thr Cys Ala Thr Thr Thr Thr Cys Thr Cys Ala Ala
1220 1225 1230

Cys Gly Gly Gly Ala Gly Thr Cys Thr Cys Ala Thr Ala Ala Gly
1235 1240 1245

Gly Cys Gly Thr Thr Thr Ala Cys Thr Thr Thr Cys Ala
1250 1255 1260

Ala Gly Cys Cys Ala Cys Thr Ala Thr Gly Thr Gly Thr Cys
1265 1270 1275

Thr Gly Thr Gly Ala Thr Ala Ala Thr Thr Gly Thr Ala Ala Ala
1280 1285 1290

Ala Cys Gly Cys Cys Thr Thr Cys Thr Thr Thr Ala Gly Cys

1295 1300 1305

Cys Ala Ala Thr Ala Cys Ala Cys Thr Thr Thr Ala Cys Thr Ala
1310 1315 1320

Cys Cys Ala Ala Gly Ala Ala Ala Ala Thr Ala Thr Ala Thr Ala
1325 1330 1335

Cys Cys Cys Thr Ala Thr Gly Gly Ala Thr Thr Thr Cys Ala Ala
1340 1345 1350

Gly Ala Thr Gly Gly Ala Thr Cys Gly Cys Gly Gly Cys Gly Gly
1355 1360 1365

Cys Ala Ala Gly Gly Ala Gly Cys Gly Ala Ala Thr Cys Cys
1370 1375 1380

Cys Cys Gly Gly Gly
1385

<210> 7
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Derived from *X. nematophilus*

<400> 7
ttagcggtaa gtggattca t 21

<210> 8
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> Derived from *X. nematophilus*

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aggcaaatca acaatcaaat g 21

<210> 9
<211> 20
<212> DNA
<213> Artificial Sequence

<220>

<223> Derived from X. nematophilus

<400> 9

gacgtaaact aacaactaaa

20

<210> 10

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from X. nematophilus

<400> 10

tgatggcaga acaggctact t

21

<210> 11

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from X. nematophilus

<400> 11

tctgcaacaa cgacatcttc t

21

<210> 12

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from X. nematophilus

<400> 12

ggacacaaga accgaatcag

20

<210> 13

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from P. luminescens

<400> 13

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<210> 14

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from *P. luminescens*

<400> 14

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tgaactggat tttgaaggtc

<210> 15

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from *P. luminescens*

<400> 15

20

gcagtagact tattcgtgag

<210> 16

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from *P. luminescens*

<400> 16

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cttgcacca ccgcagagat

<210> 17

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from *P. luminescens*

<400> 17

20

gttaaatccgc gaagacaacc

<210> 18

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Derived from *P. luminescens*

<400> 18

20

tgacggttca tagtgttgg

<210> 19
<211> 20
<212> DNA
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<220>
<223> Derived from *P. luminescens*

<400> 19
aggttgtgat acttggcagt

20

<210> 20
<211> 20
<212> DNA
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<220>
<223> Derived from *P. luminescens*

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ccatcatttc acataaccga

20